

Biosolids Production in Australia

The Australian and New Zealand Biosolids Partnership
National Survey of Biosolids Production and End Use 2013



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Important note

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1.1 INTRODUCTION

In 2010, the Australian and New Zealand Biosolids partnership commissioned a national survey to identify the main features of biosolids management. This report represents an update based on survey results for 2013. This survey catalogues the following primary parameters:

- δ Biosolids production;
- δ Biosolids end use;
- δ Biosolids stabilisation grade;
- δ Biosolids contamination grade;
- δ Biosolids primary stabilisation process;
- δ Biosolids dewatering process.

These are the same parameters as the 2010 survey, with the exception of contamination grade which was added to the 2013 survey data. The results of the 2013 survey are presented below on a national and state basis. Some discussion is also provided on significant changes since 2010.

1.2 METHOD

The approach used to determine the biosolids production in Australia was to survey all plants over 25,000 people or 5 ML/day. The ANZBP identified that this criteria would capture around about 80% of Australia's population. In the course of the survey many water utilities provided information on plants smaller than this threshold and where they did, the data was included.

All classifications are made on the basis of tonnes of production.

1.3 CLASSIFICATIONS

To enable relatively simply analysis and presentation of the data each area of information, such as end use, was classified into a number of broad groupings. These groupings are discussed below.

1.3.1 Production

Production is presented in terms of tonnes of dry biosolids.

1.3.2 End use

The following classifications were used for end use:

- δ Agriculture: for biosolids which is applied to land for its fertiliser value without value added processing;
- δ Landscaping (compost): for biosolids which processed through a composting facility and used for landscaping or other horticultural use;
- δ Forestry: for biosolids which is applied to plantation forests to aid tree growth;
- δ Landfill: for biosolids which is disposed to landfill;
- δ Ocean discharge: for biosolids which is discharged to the ocean;
- δ Stockpile: for biosolids which is stored, pending future planning, processing or use;
- δ Land rehabilitation: for biosolids which is applied to land, such as mine sites for rehabilitation of the land;
- δ Other: and other uses;
- δ Unspecified: for plants which did not respond or for which the end use could not be identified.

1.3.3 Stabilisation grade

Stabilisation grade was classified on the basis on the basis of an A, B or C grading. This grading was adopted in light of the broad variation in nomenclature for stabilisation grading across Australia (and New Zealand).

The equivalent grades are shown in the table below.

Classification	NSW	Vic	SA	Qld	Tas	WA	NZ
A	A	T1, T2,	A,	A	A	P1, P2,	A
B	B	T3	B	B	B	P3	B
C	C	Unstabilised	Unstabilised	C	C	P4	Unstabilised

1.3.4 Contamination grade

Contamination grade was classified on the basis on the basis of an A, B, C, D, Unsuitable for Use or Unspecified. This grading was adopted in light of the broad variation in nomenclature for stabilisation grading across Australia (and New Zealand).

The equivalent grades are shown in the table below.

Classification	NSW	Vic	SA	Qld	Tas	WA	NZ
A	A	C1	A	A	A	C1	A
B	B	C2	B	B	B	C2	B
C	C	C2	C	C	C	C2	B
Unsuitable for Use	D	Unsuitable for use	Unsuitable for use	D	Unsuitable for use	Unsuitable for use	Unsuitable for use

1.3.5 Stabilisation process

Classification of the stabilisation process was made on the basis of the primary stabilisation process following the sewage treatment process. The following stabilisation process categories were used.

- δ Anaerobic digestion
- δ Aerobic digestion
- δ Agitated air drying
- δ Thermal drying
- δ Autothermal thermophilic aerobic digestion
- δ Thermal hydrolysis (CAMBI)
- δ Composting (used only for biosolids with no prior stabilisation)
- δ Incineration
- δ Lagoon (used for biosolids stored in liquid form)
- δ Lime stabilisation
- δ Long term storage (used for biosolids stored in dewatered form)
- δ Thermophilic anaerobic digestion

- δ None
- δ Other
- δ Unspecified

1.3.6 Dewatering process

Classification of the dewatering process was made on the basis of the following categories:

- δ Belt filter press
- δ Conventional centrifuge
- δ High solids centrifuge
- δ Drying bed or drying lagoons
- δ None
- δ Other
- δ Unspecified

1.4 FINDINGS

The findings of the survey are presented below.

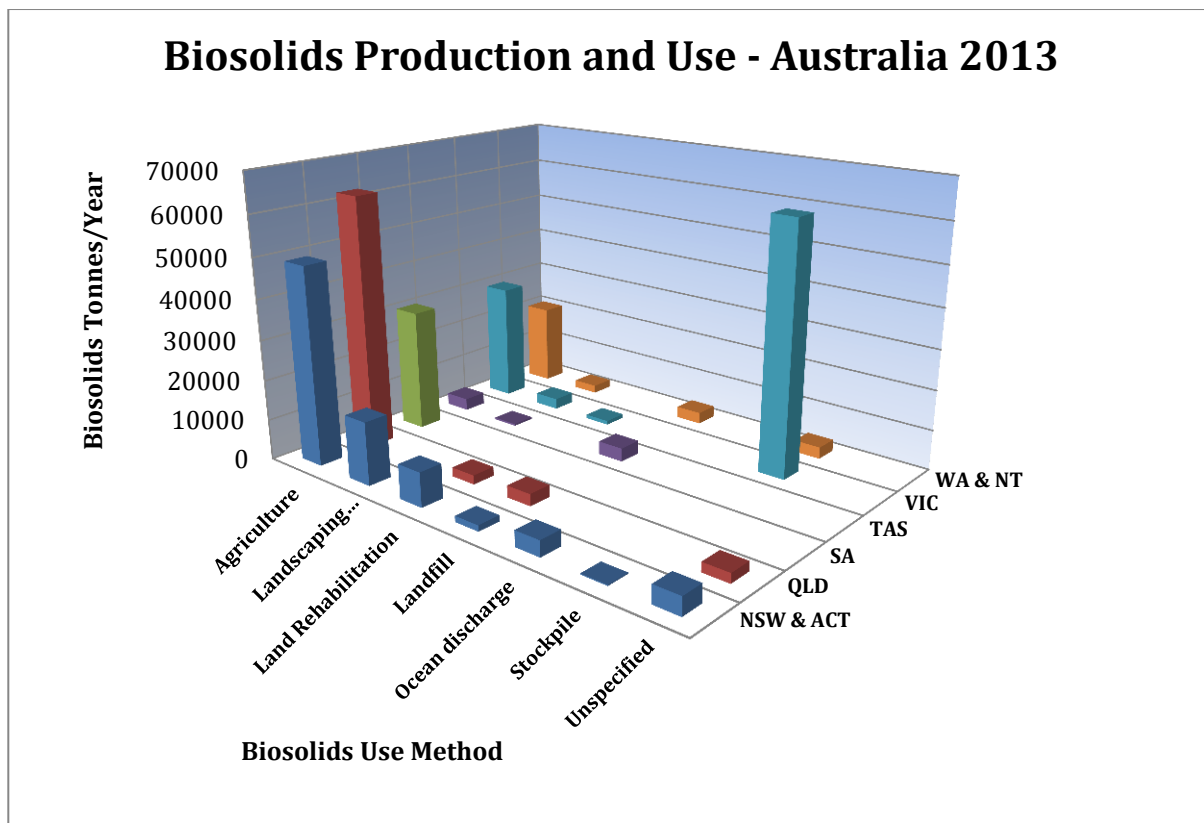
1.4.1 Production

The total biosolids production of Australia identified in the survey is about 330,000 tonnes per year of dry solids. This compares to 300,000 tonnes in 2010. This does not reflect any significant increase in biosolids production, and is due to both incremental increase in production and greater inclusion within the survey and possible changes to analysis and records keeping. The average solids content of biosolids is around 26% and this equates to around 1.3 million tonnes of biosolids in dewatered form (also called wet).

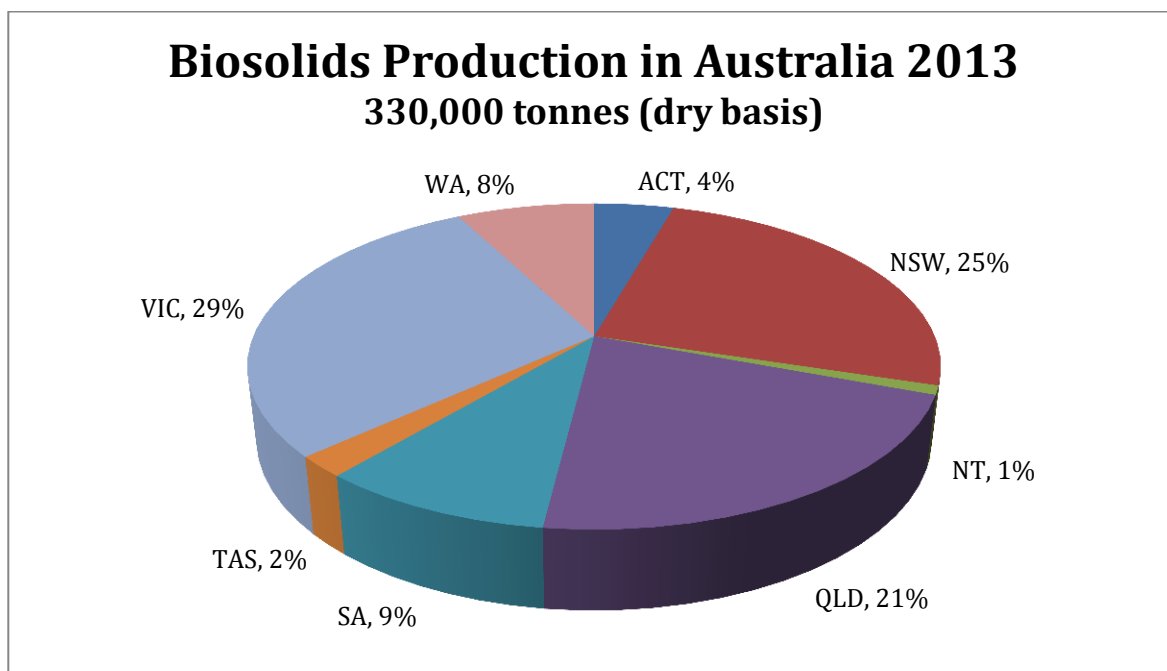
A breakdown of biosolids production and use by state, expressed in dry tonnes, is given in the table below.

	Agriculture	Landscaping (compost)	Land Rehabilitation	Landfill	Ocean discharge	Stockpile	Unspecified	Other	TOTAL
NSW & ACT	49,132.0	15,7245.0	8,577.5	1,499.5	3,942.0	238.5	4,416.5	14,600.0	98130.5
QLD	62,556.0		2,263.0	2,961.5			2,391.5		70,172.0
SA	30,477.5								30,477.5
TAS	2,993.0	473.0		3,359.5					6,825.5
VIC	29,617.0	2,690.0	962.0			62,051.0		317.0	95,638.0
WA & NT	20,440.0	2,007.5		2,874.5		2,935.0			28,256.5
TOTAL	195,215.5	20,895.5	11,802.5	10,695.0	3,942.0	65,224.5	6,808.0	14,917.0	329500.0

This is represented graphically in the chart below.



A breakdown by state of biosolids production is given in the chart below.

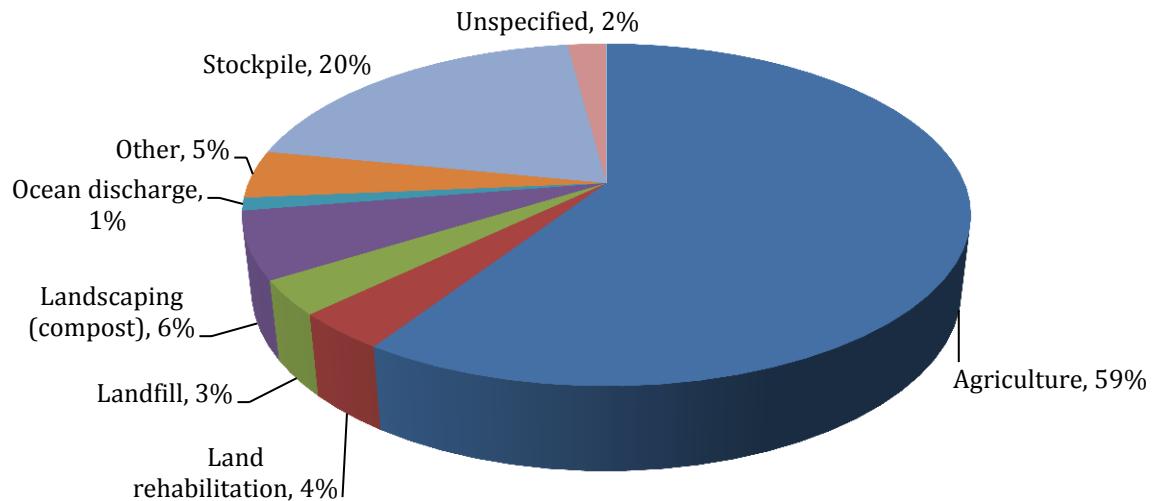


There were no significant changes in proportional state contribution since 2010.

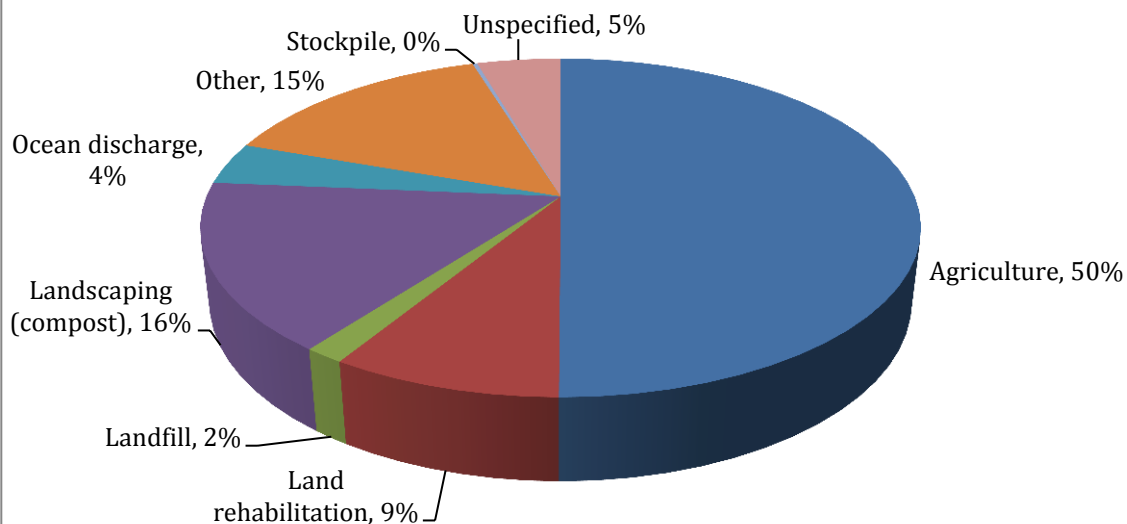
1.4.2 End use

Biosolids end use nationally and for each state is presented in the charts below. Overall, there was a marginal decrease in biosolids used for composting (down from 10% to 6%) and that stockpiled (down from 23% to 20%), with much of this now used for agriculture (up from 55% to 59%) and land rehabilitation (a new category with 4%). This indicates a marginal trend towards greater beneficial use of biosolids.

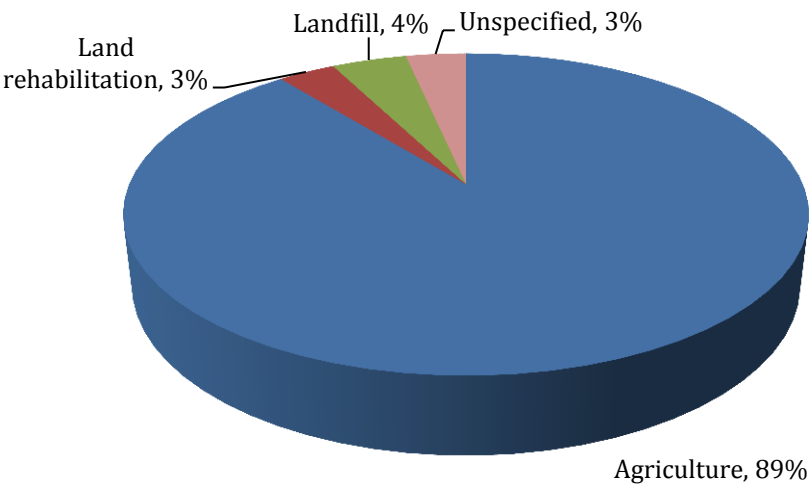
Biosolids End Use in Australia 2013



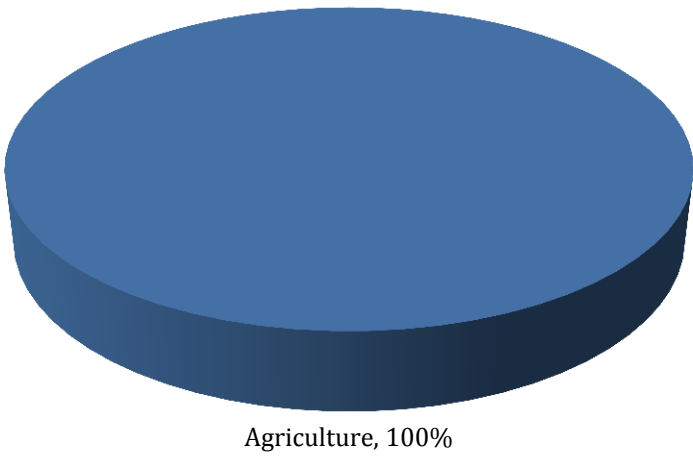
Biosolids End Use in NSW & ACT 2013



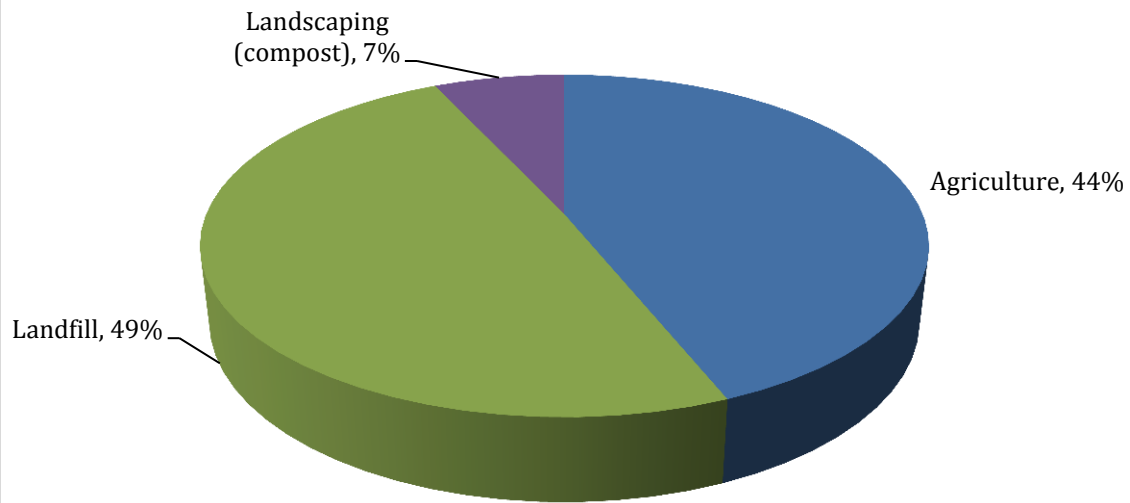
Biosolids End Use in Qld 2013



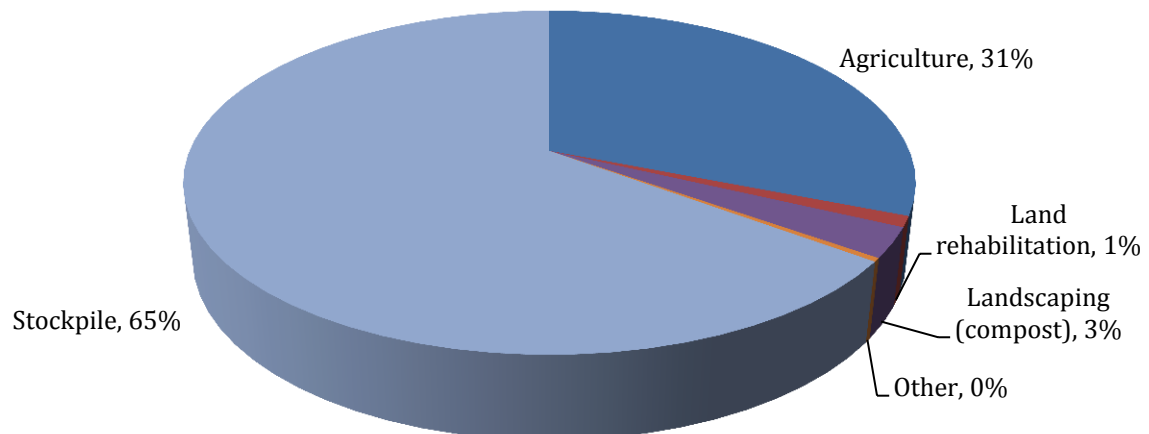
Biosolids End Use in SA 2013

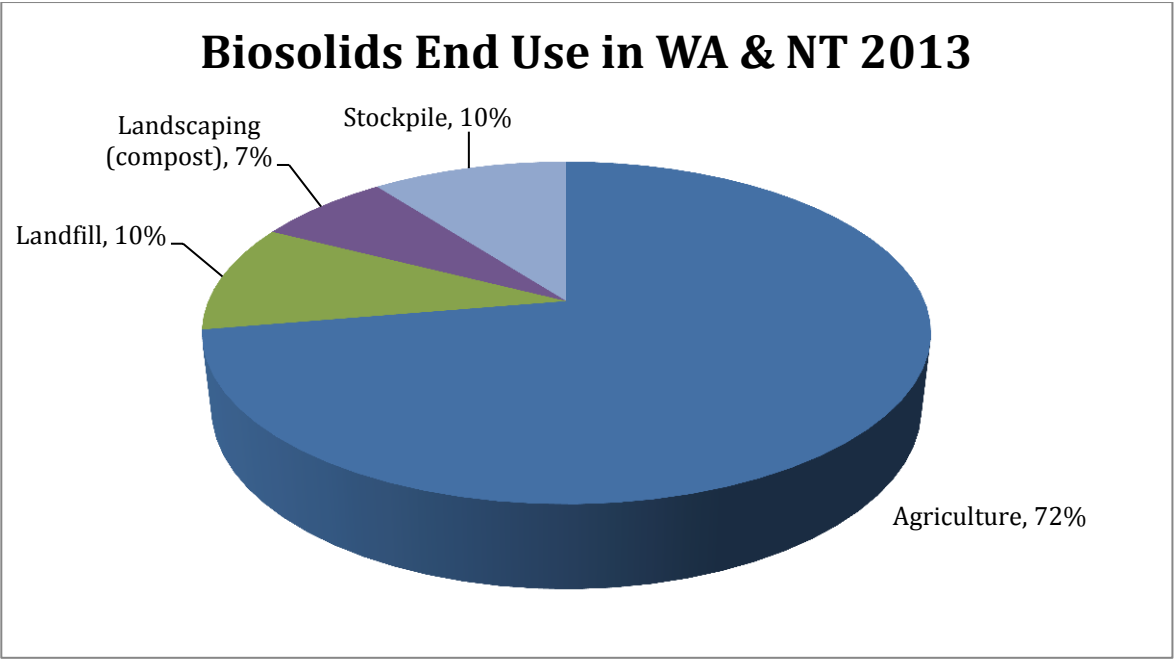


Biosolids End Use in Tas 2013



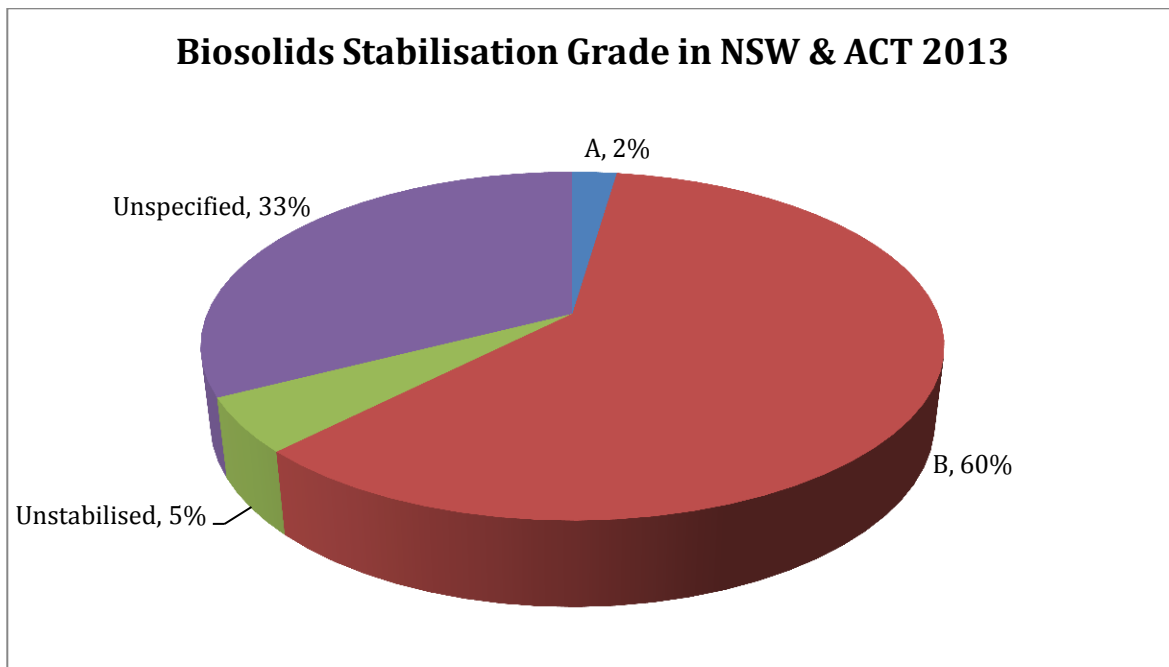
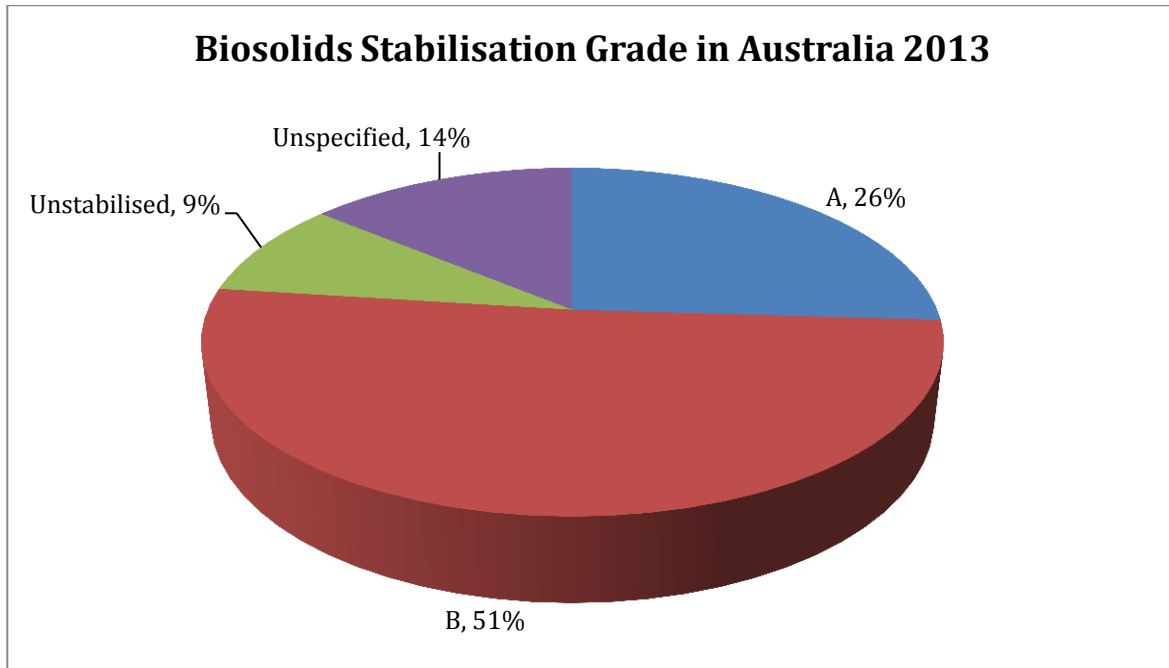
Biosolids End Use in Vic 2013

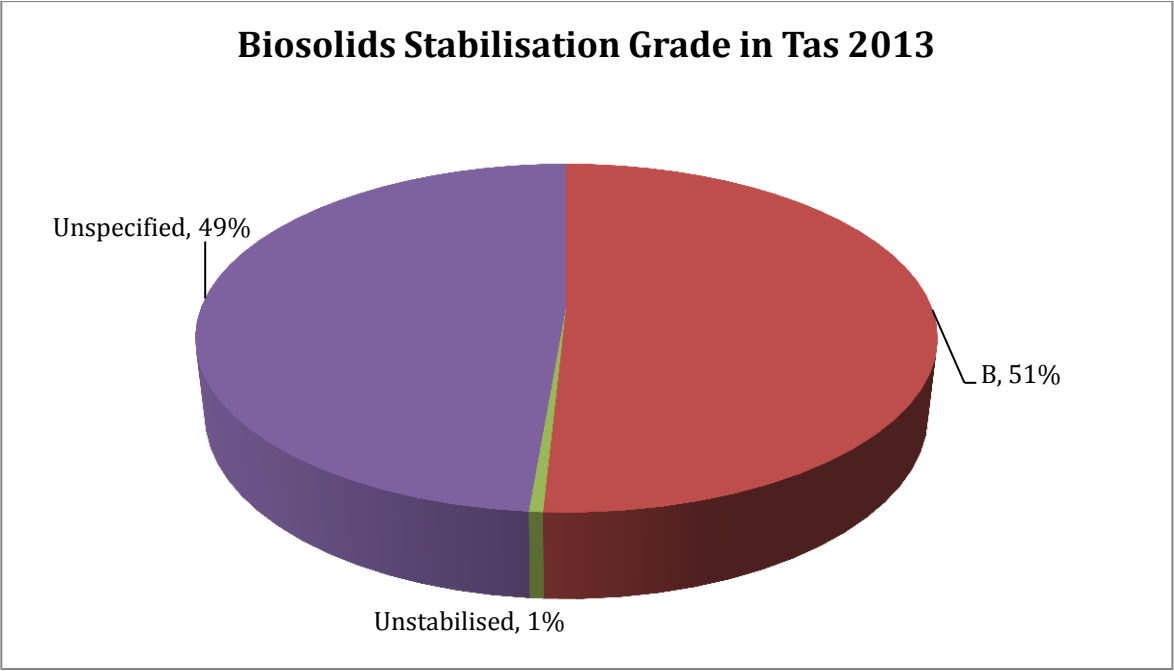
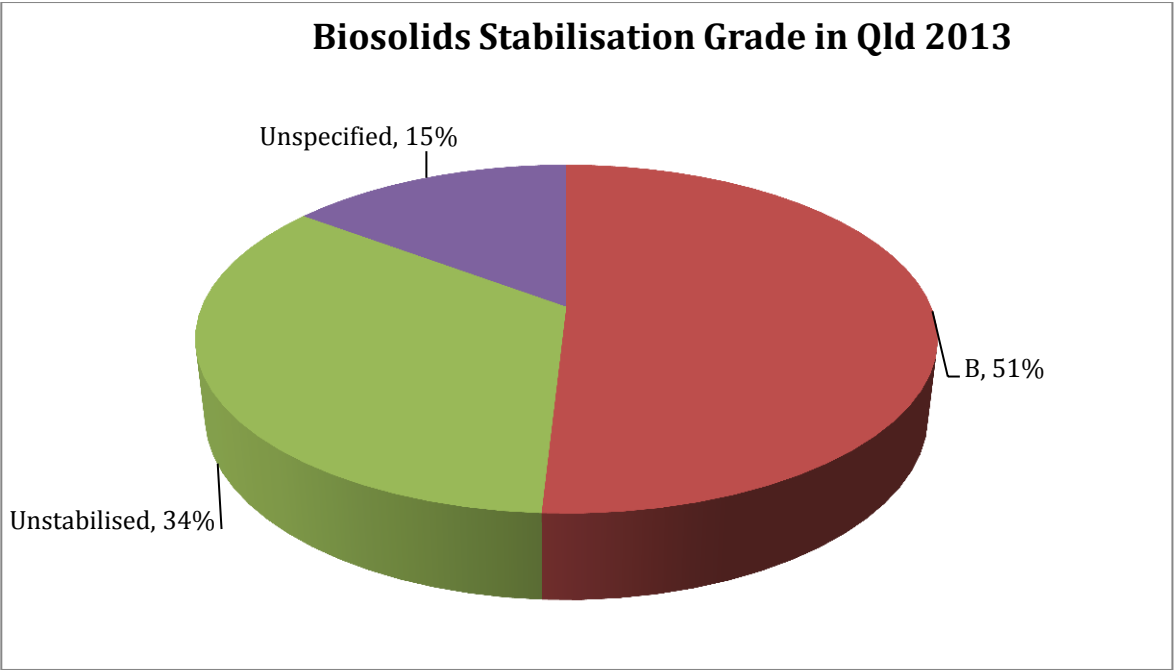




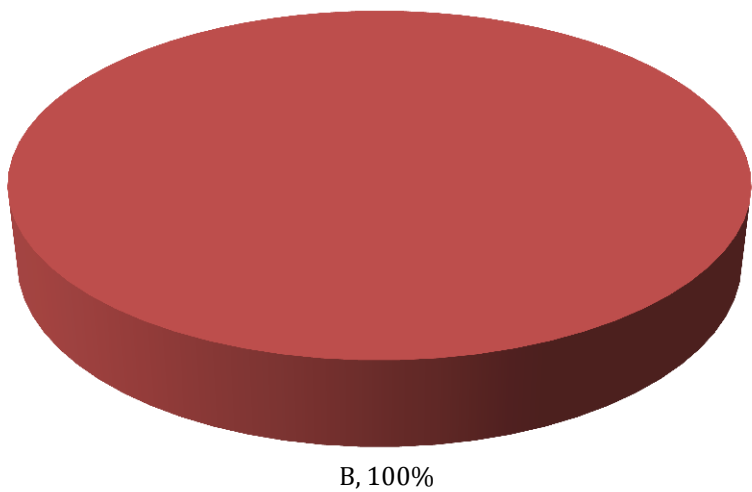
1.4.3 Stabilisation grade

Biosolids stabilisation grade nationally and for each state is presented in the charts below. Overall, there was a significant decrease in Grade A biosolids (down from 41% to 26%) with much of this now Grade B (up from 36% to 51%). The change in grade is significant however is related to how respondents categorised their biosolids rather than a significant decrease in stabilisation processing.

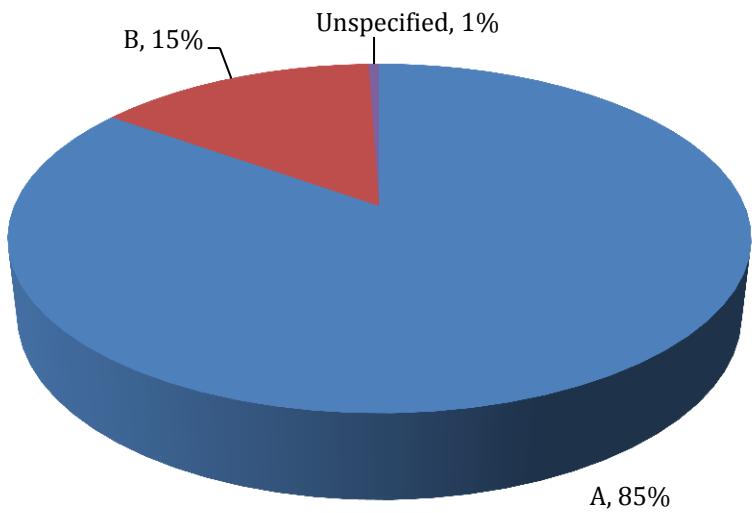


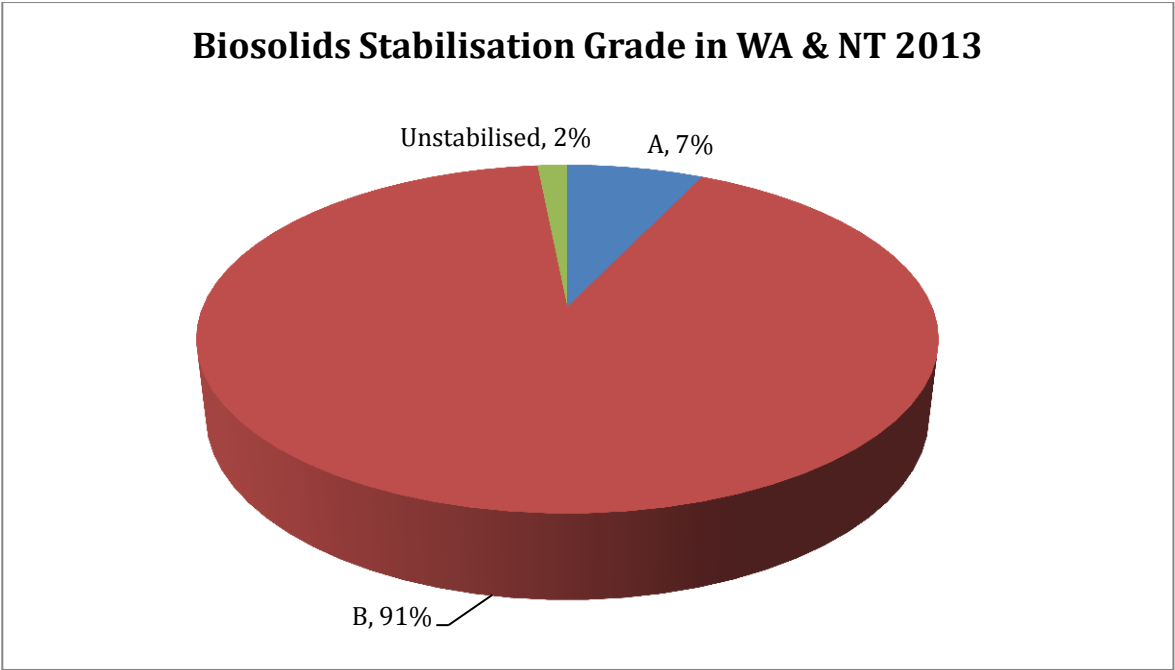


Biosolids Stabilisation Grade in SA 2013



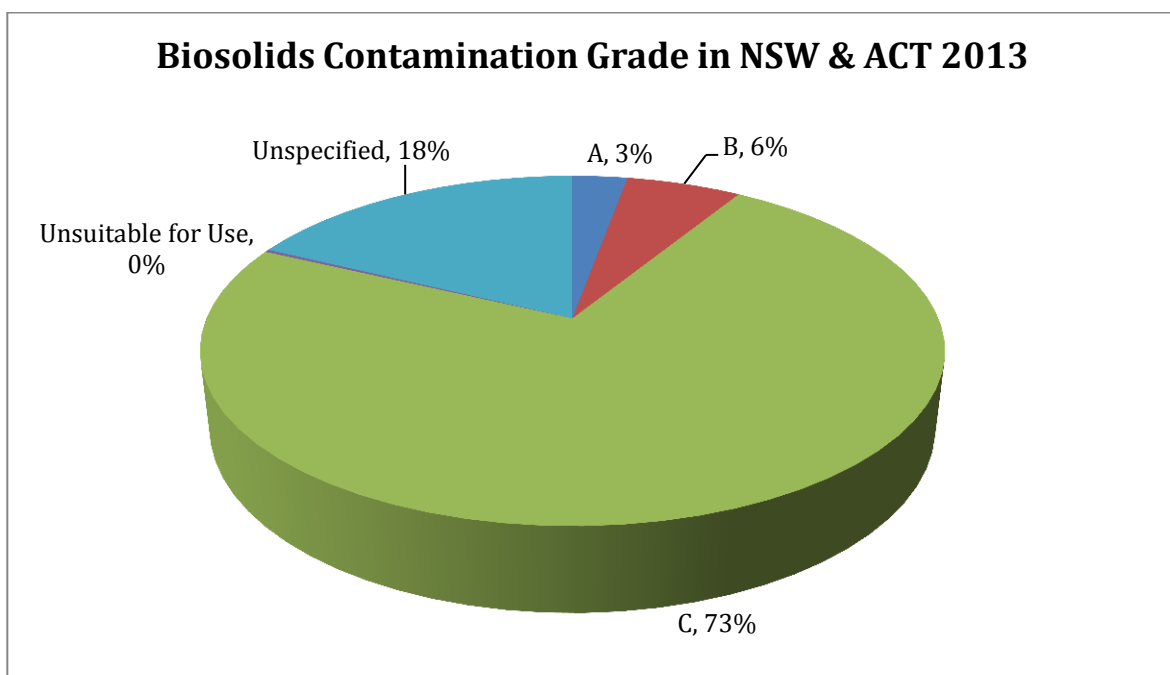
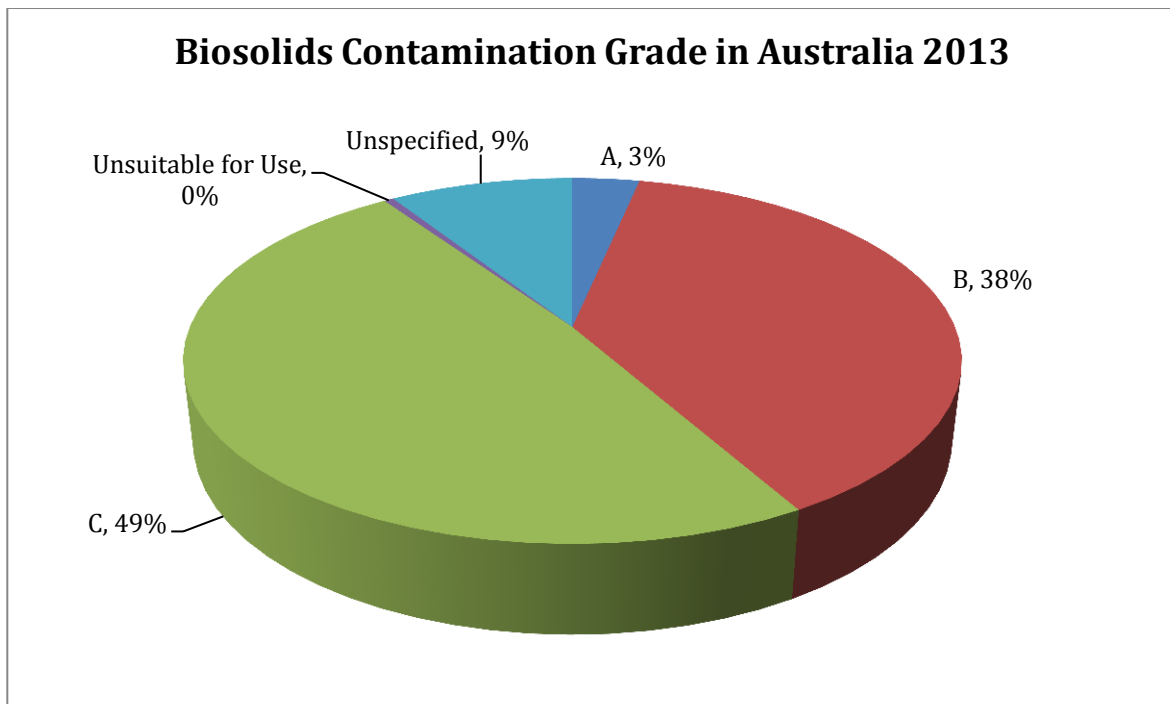
Biosolids Stabilisation Grade in Vic 2013

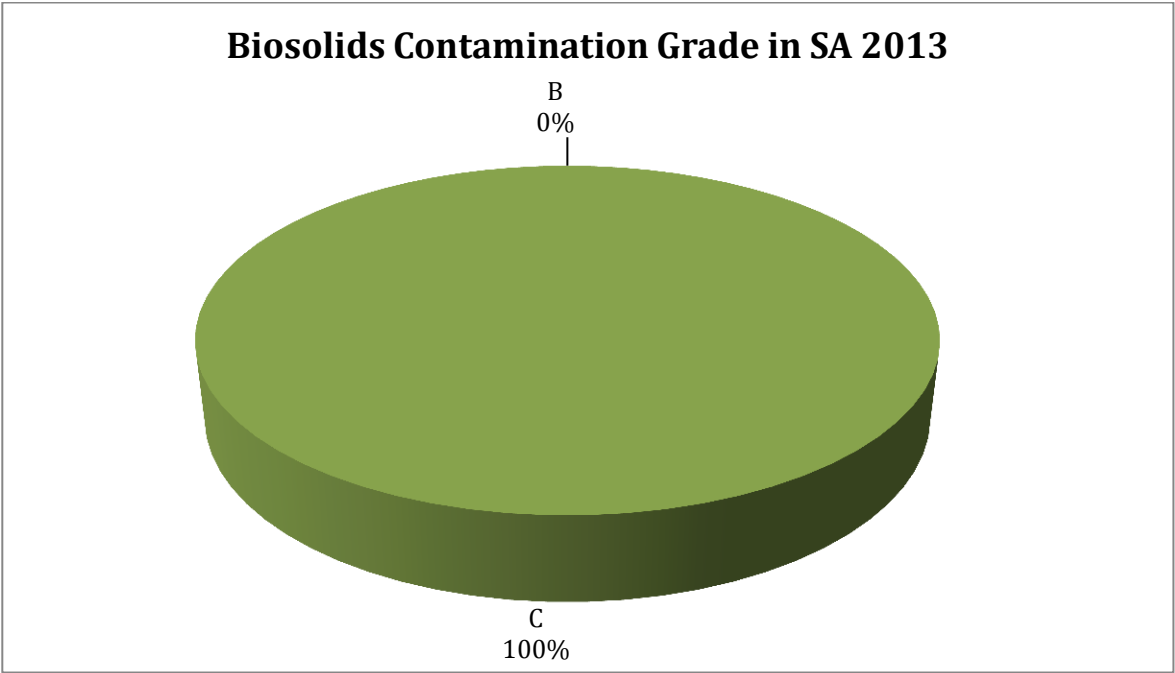
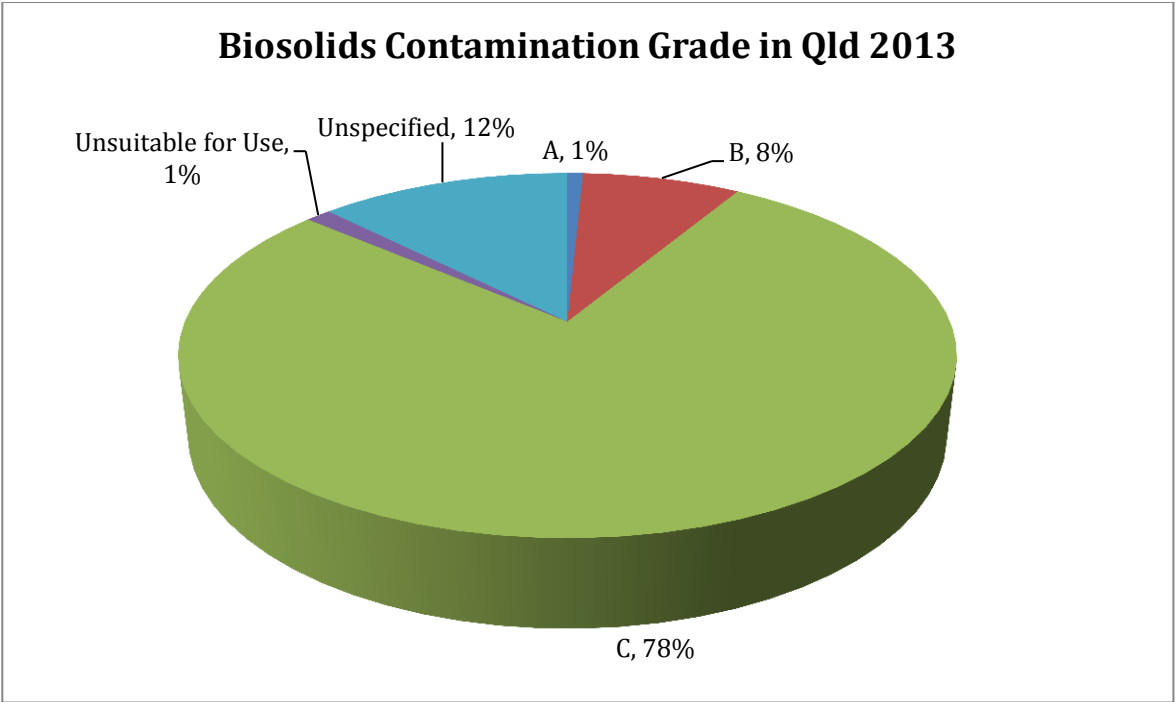




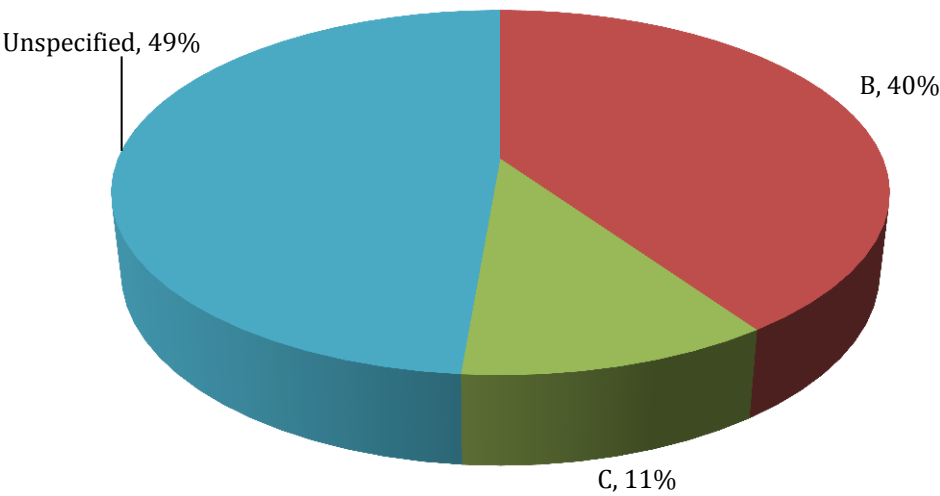
1.4.4 Contaminant grade

Biosolids contaminant grade nationally and for each state is presented in the charts below. This was a new survey field in 2013 so trends cannot be determined.

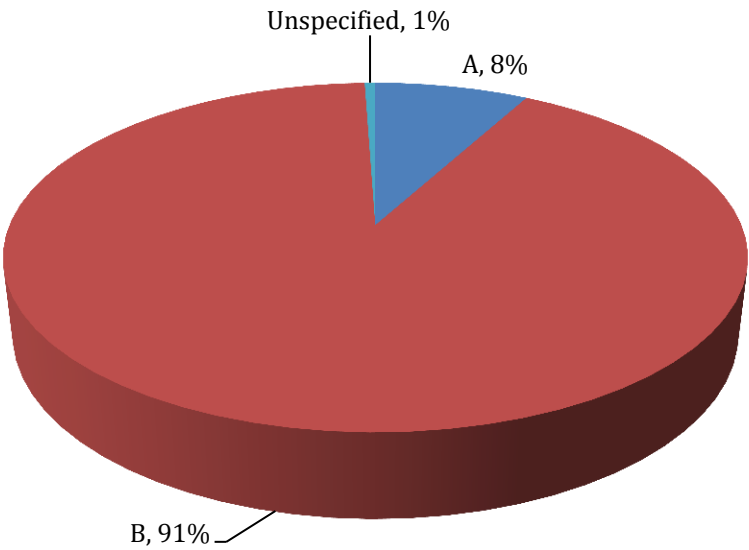


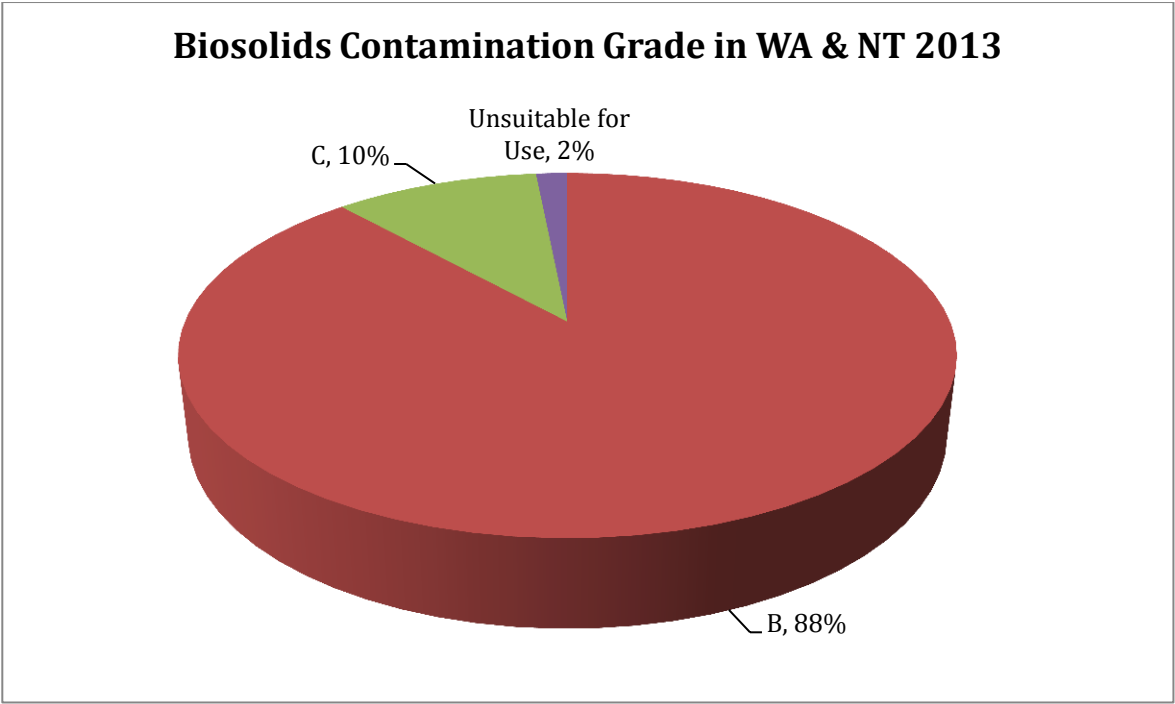


Biosolids Contamination Grade in Tas 2013



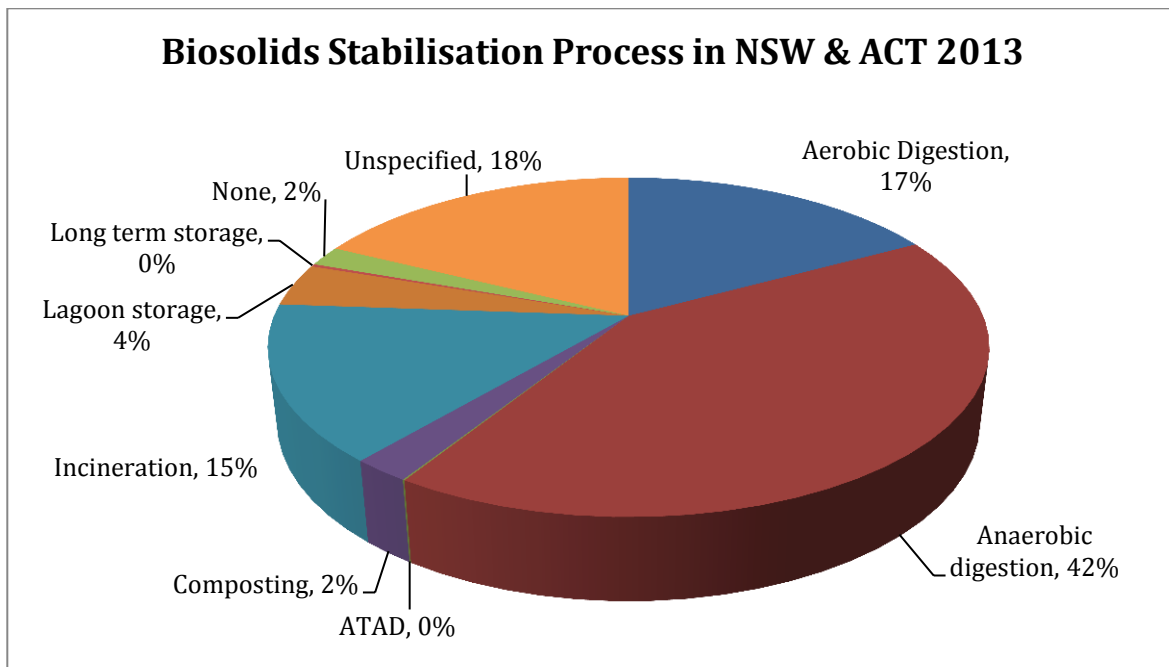
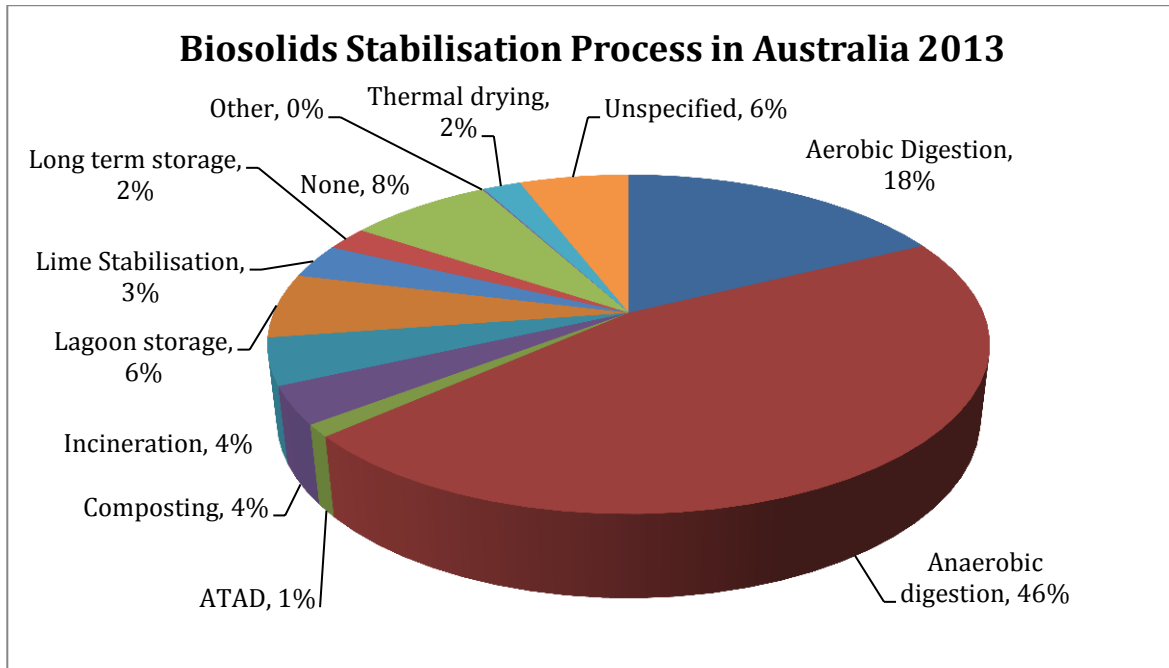
Biosolids Contamination Grade in Vic 2013



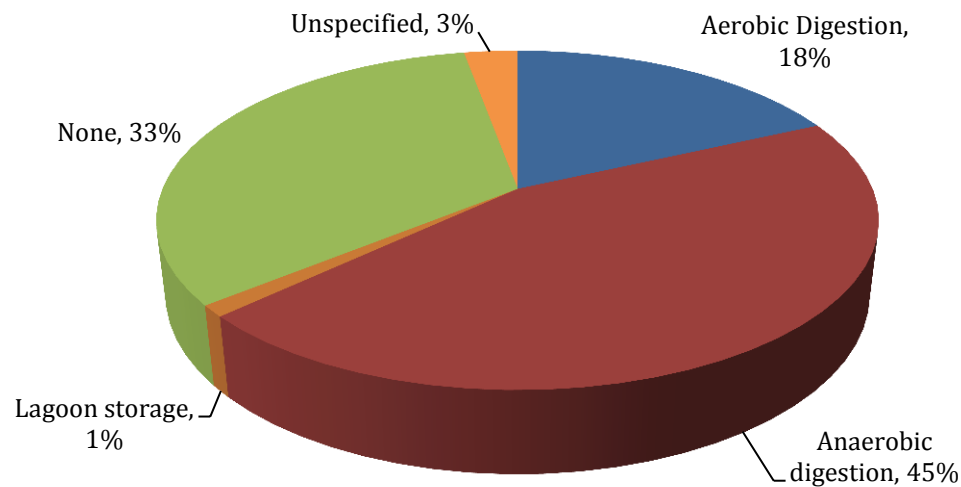


1.4.5 Stabilisation process

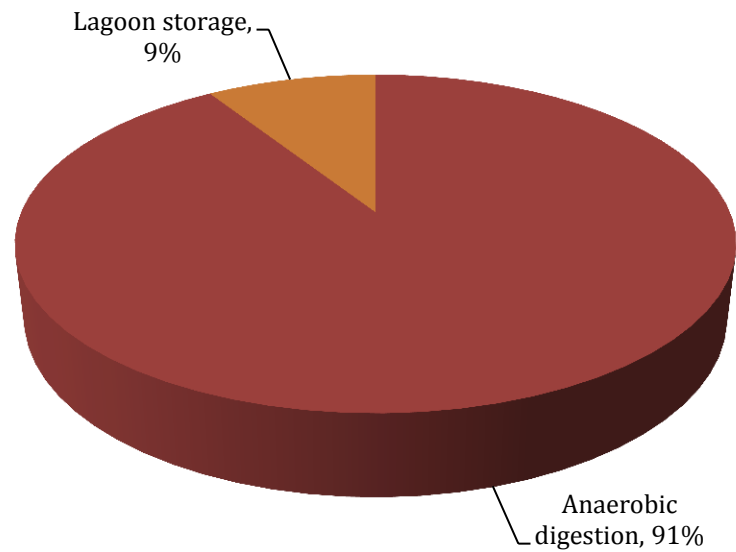
Biosolids stabilisation process nationally and for each state is presented in the charts below. Overall, there was a moderate increase in both Aerobic Digestion (up from 12% to 18%) and Anaerobic Digestion (up from 31% to 46%) with significantly less being stockpiled (down from 20% to 2%). The increases in aerobic and anaerobic digestion are due to new plants coming on line.



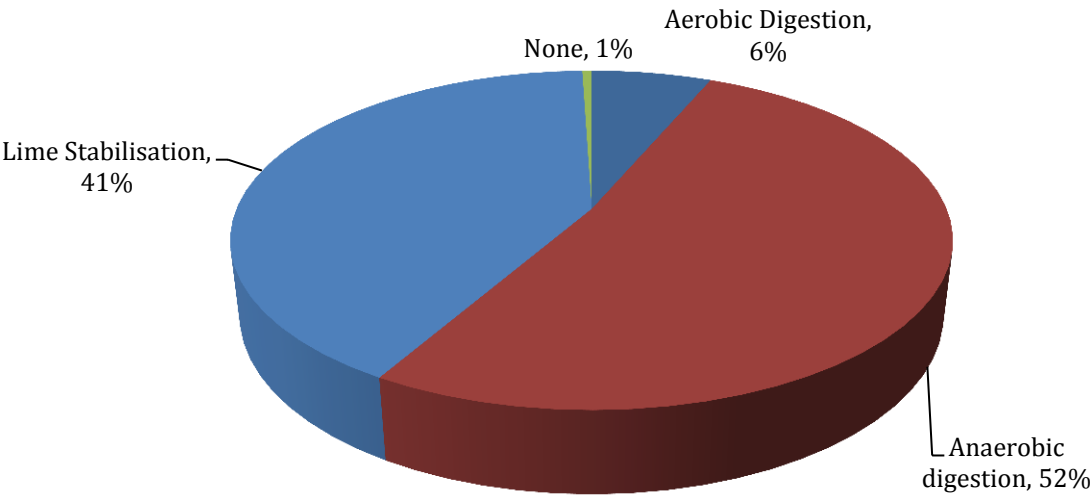
Biosolids Stabilisation Process in Qld 2013



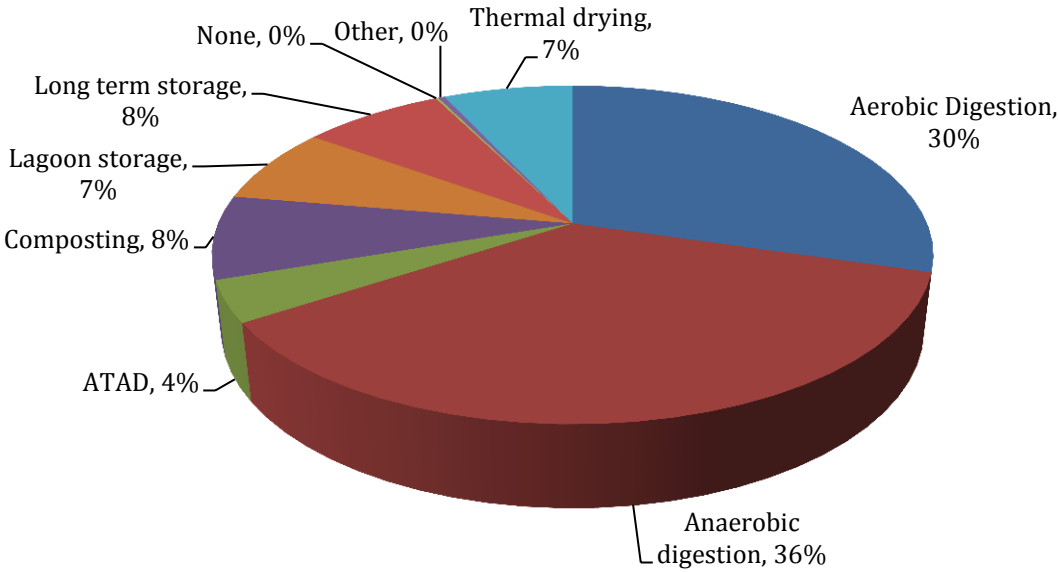
Biosolids Stabilisation Process in SA 2013

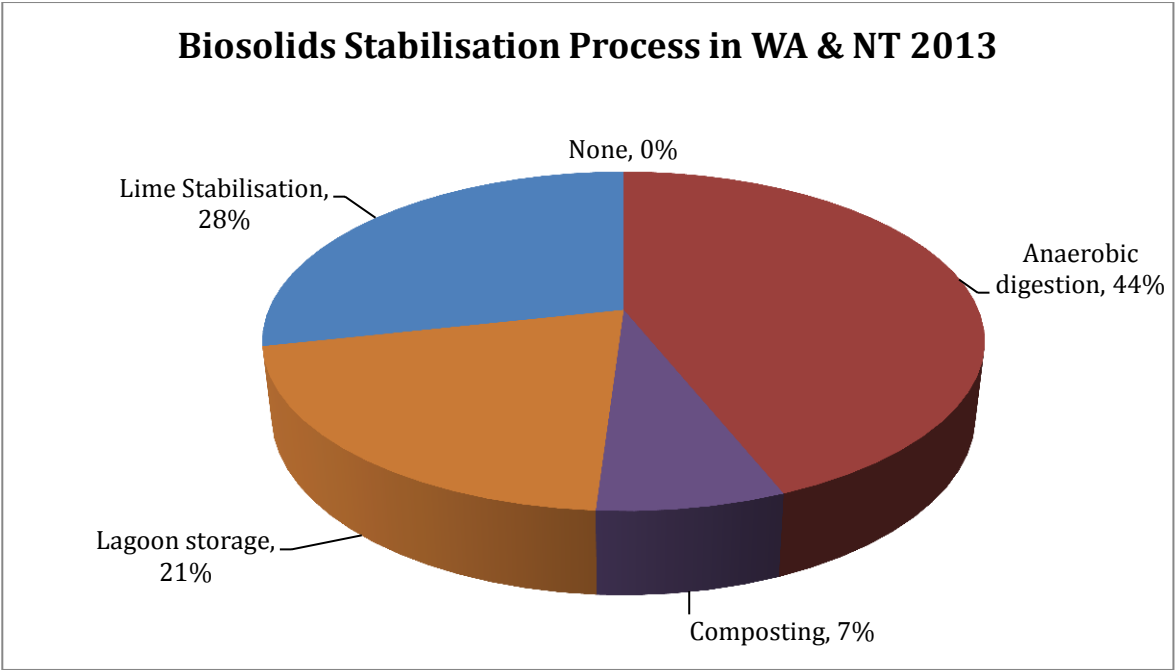


Biosolids Stabilisation Process in Tas 2013



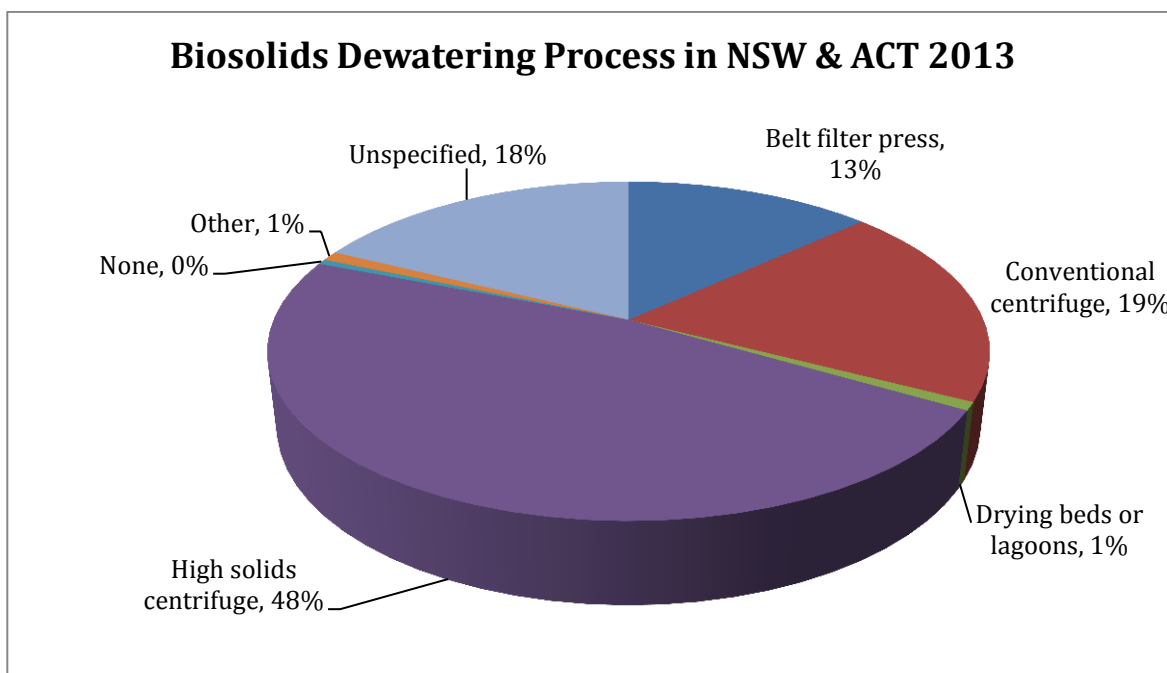
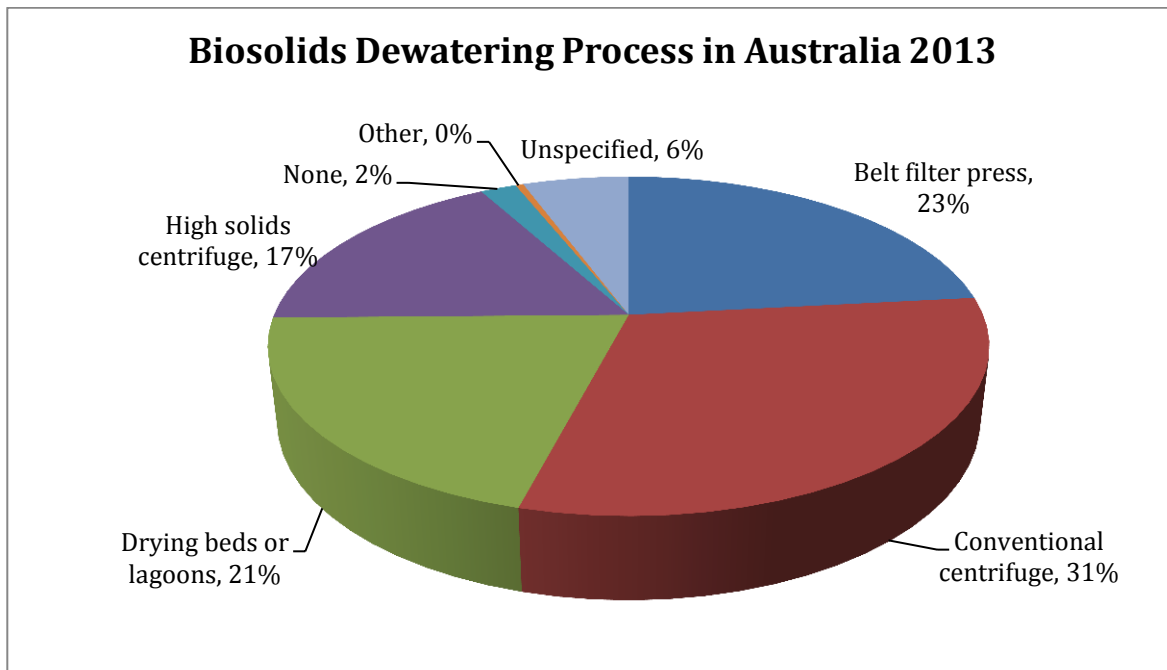
Biosolids Stabilisation Process in Vic 2013

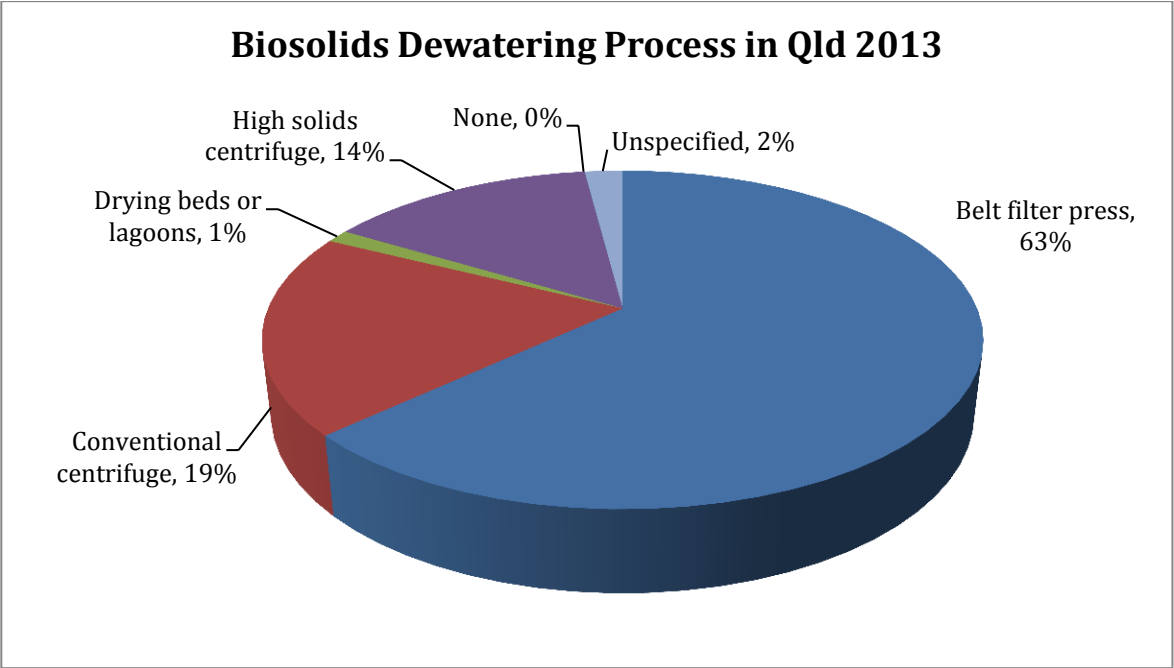
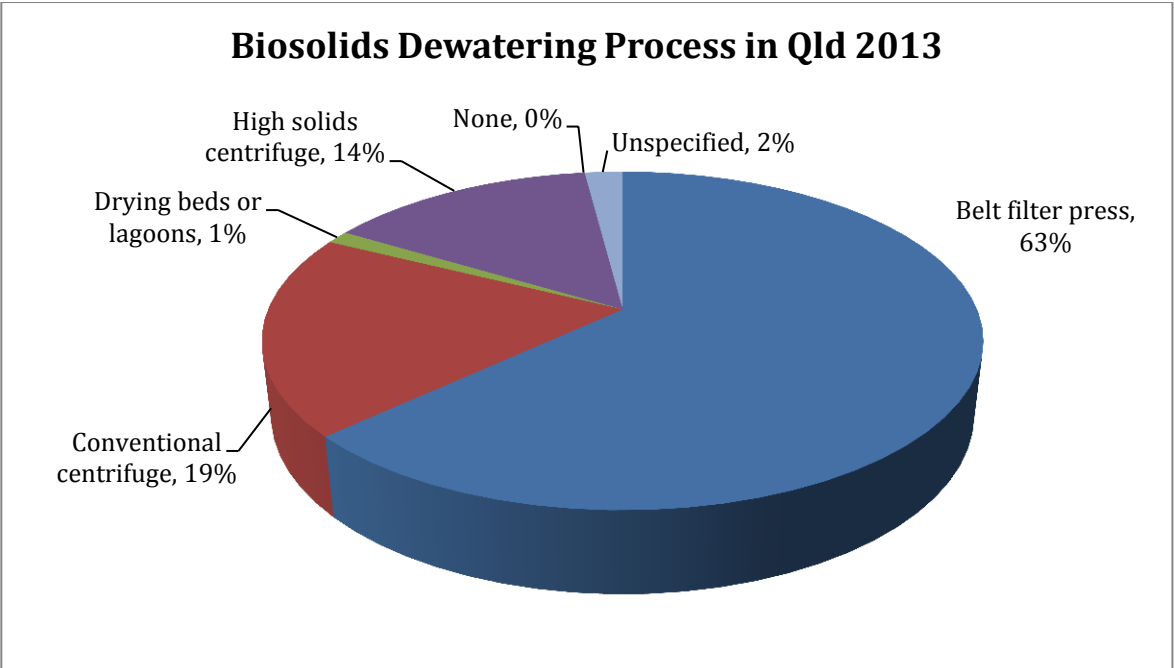


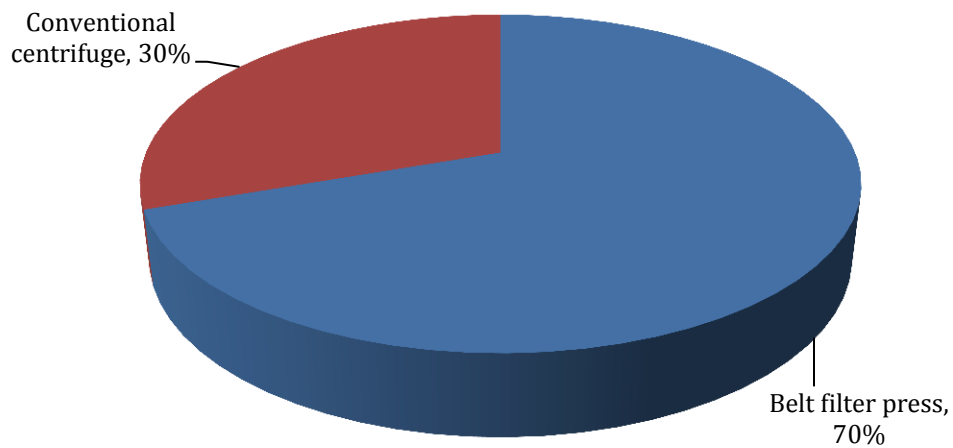
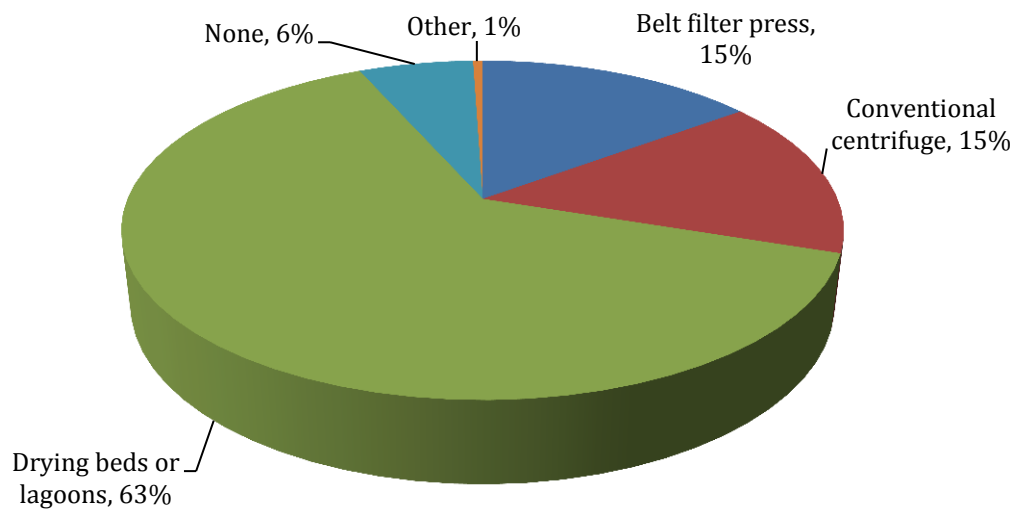


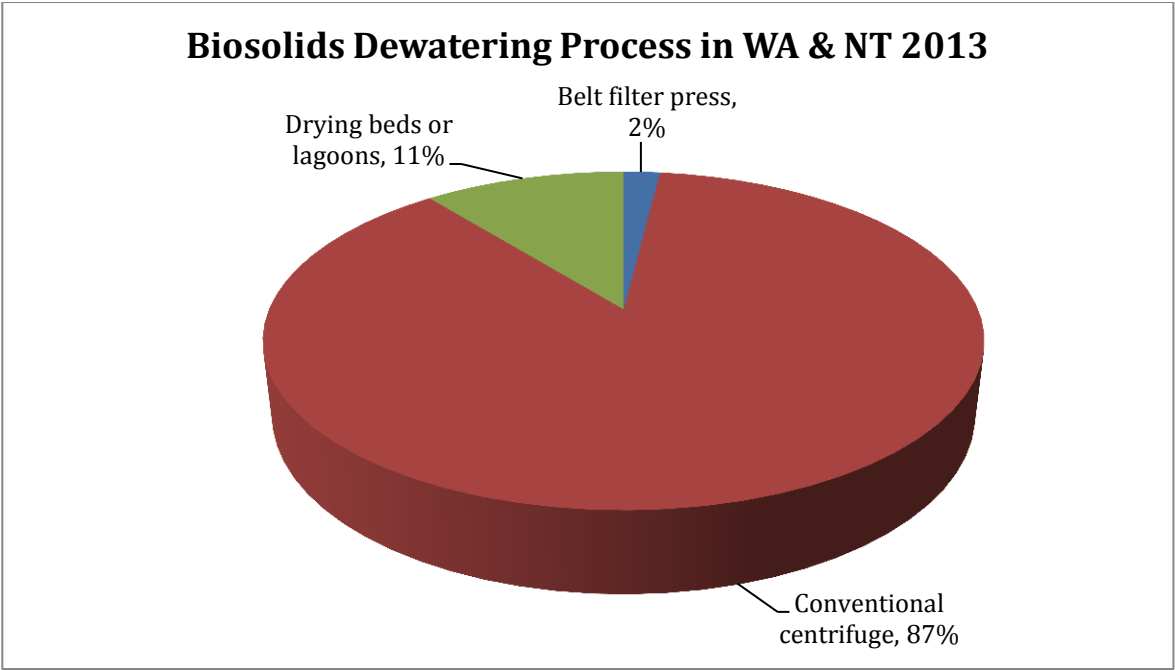
1.4.6 Dewatering process

Biosolids dewatering process nationally and for each state is presented in the charts below. Overall, there was a moderate increase in centrifuge dewatering (up from 39% to 48%) with much of this attributable to reporting (unspecified decreasing from 12% to 6%).





Biosolids Dewatering Process in Tas 2013**Biosolids Dewatering Process in Vic 2013**





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